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Ratings of Residents' Clinical Competence And Performance on Certification Examination

John J. Norcini, Ph.D., George D. Webster, M.D., Louis J. Grosso, Linda L. Blank, and John A. Benson, Jr., M.D.

Abstract—The American Board of Internal Medicine (ABIM) requires directors of internal medicine residency programs to rate their residents in overall clinical competence and its essential components. In the study reported here, the authors investigated the relationships among these ratings and compared them with the residents' performance on the ABIM's certification examination in the years 1980 through 1985. The ratings of the individual components of clinical competence were correlated moderately with examination performance and very highly with each other. The individual components that were less dependent on medical knowledge (for example, interpersonal skills or humanism) had slightly smaller correlations with examination performance. The ratings of overall clinical competence were also related moderately to examination performance. Changes in the pattern of the ratings over time indicated that fewer candidates were receiving lower ratings while more were receiving higher ratings. The pass rates for each rating level were the same or lower; for example, the pass rate for candidates rated 5 was 68 percent in 1980 and 56 percent in 1985. The similar ranking of examinees by the program directors and the examination provides evidence for the validity of the examination.

To assure that certification in internal medicine is as comprehensive as possible, the certification process includes assessments of a candidate's skills in all the components of competence the American Board of Internal Medicine (ABIM) has deemed essential. These components are clinical skills, interpersonal skills, humanistic qualities, attitudes, medical knowledge, ethics, and clinical judgment. Directors of internal medicine residency programs are required to assess these skills in their residents, and their judgments determine residents' admission to the internal medicine certifying examination. To assist program directors in their judgments, the ABIM established in 1972 its Clinical Competence Program, which recommends continuing assessment by multiple observers, recommends types of rating forms and procedures, and monitors the assessment process by regularly scheduled visits to all residency programs by representatives of the ABIM (1).

The research for the present study was supported by the American Board of Internal Medicine (ABIM), Philadelphia, Pennsylvania.

Dr. Norcini is director of psychometrics, Dr. Webster senior vice-president for evaluation and research, and Mr. Grosso a psychometrician, all at the national office of the ABIM. Dr. Benson is president and Ms. Blank assistant director of the Executive Office and senior associate to the president, both at the Portland, Oregon, regional office of the ABIM.

The written certification examination focuses on the evaluation of knowledge and clinical judgment. The ABIM continually studies the examination's validity and closely monitors the comparability of certification standards from year to year. In the absence of a single standard, these studies have employed a number of different external criteria and include program directors' ratings of the clinical competence of their residents. While the ratings were designed and continue to be used for admission to the examination, they have proven useful in monitoring the comparability of the certification standards. As part of this latter use, the stability and comparability of the ratings are important considerations, and the ABIM has studied trends in the evaluations of the components of competence and the relationships of the components to each other and the examination. In the study reported here, the authors compare program directors' ratings with examination performance for the candidates who took the certifying examinations in the six years from 1980 through 1985.

Methods

Directors of internal medicine residency programs submit evaluations of their residents' overall clinical competence and its components to the ABIM after the residents apply to take the certification examination. These evaluations are made on a 9-point rating scale. Overall competence ratings of 1 to 3 are considered "unsatisfactory," 4 to 6 are "satisfactory," and 7 to 9 are "superior." Candidates with ratings of less than 4 are not permitted to take the examination and, consequently, were not included in the present study. The study was further restricted to candidates who took the examination in the years 1980 through 1985 for the first time and in the year they finished training. For candidates who received training in more than one program, the program director's rating for the third year of training was used. A total of 26,950 candidates comprised the sample studied.

The examinations consisted of patient management problems and three types of multiple-choice questions. After scoring, the mean of the "reference" group (all first-time takers of the examination who graduated from U.S. or Canadian medical schools and recently completed three years of training in an approved residency program) was 500 with a standard deviation of 100. Details of the scoring process can be found elsewhere (2, 3). The passing level was set at 400, which is one standard deviation below the mean score of the reference group.

Analyses include comparison of the program directors' ratings of the candidates' overall clinical competence, clinical skills, interpersonal skills, humanistic qualities, attitudes, medical knowledge, and clinical judgment with the candidates' examination performance.

Results

Table 1 presents the number and percentage of the candidates who received each rating (4 through 9) for overall clinical competence. Inspection of these data revealed a normal distribution of ratings within each year; that is, very few candidates received the extreme ratings of 4 and 9, while most received ratings of 6 and 7.

The percentages of candidates receiving ratings of 6 and 9 (the highest ratings of satisfactory and superior, respectively) remained fairly stable across the six years, while the percentages of candidates receiving ratings of 4 and 5 dropped, and the percentages of candidates receiving ratings of 7 and 8 rose. These data indicate that overall the 1984 and 1985 can-

TABLE 1

Numbers and Percentages of 26,950 Candidates for the Certification Examination of the American Board of Internal Medicine (ABIM) at Each Level of Rating of Overall Clinical Competence by Their Residency Program Directors, 1980 Through 1985

Rating*	1980		1981		1982		1983		1984		1985	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
9	222	5	272	6	264	6	276	6	263	6	232	5
8	773	18	720	16	733	17	763	16	856	19	845	19
7	978	22	1,042	23	1,031	24	1,094	24	1,355	30	1,332	29
6	1,349	31	1,371	31	1,268	29	1,283	28	1,225	27	1,333	29
5	779	18	820	18	792	18	888	19	661	14	638	14
4	243	6	275	6	286	6	316	7	175	4	197	4
Total	4,344	100	4,500	100	4,374	100	4,620	100	4,535	100	4,577	100

* The directors used a 9-point rating scale. These ratings are broken into three categories: superior = 7–9, satisfactory = 4–6; unsatisfactory = 1–3. The ABIM does not permit residents with ratings lower than 4 to take the examination.

didates received higher ratings than the candidates in 1980–1983. Specifically, more of the 1984 and 1985 candidates were rated 7 and 8, while fewer candidates received ratings of 4 and 5 compared with the candidates in 1980–1983. The average rating increased from 6.4 in each of the first four years to 6.6 in both 1984 and 1985.

Figure 1 presents the pass rates for the candidates at each level of rating of overall competence for each year of the study. These pass rates ranged from an average of 46 percent for those candidates receiving a rating of 4 to an average of 93 percent for those candidates receiving a rating of 9. This finding indicates that the program directors and the examinations rank candidates in a similar way despite differences in what is assessed. The examination measures medical knowledge and clinical judgment, while the program directors' ratings of overall clinical competence include these skills plus the other components of competence.

The pass rates for candidates rated superior (ratings of 7, 8, or 9) were relatively stable across the six years, varying no more than 3 percent from year to year. There was much more fluctuation, however, in the pass rates of those rated satisfactory (ratings of 4, 5, or 6). The pass rates varied as much as 13 percentage points (ratings of 4 between 1981 and 1984) across the six years of the study, with a decreasing pass rate within each rating being the general trend.

Despite these differences in pass rates, the examination scores of the different rating groups showed considerable overlap—that is, the range of scores received by candidates in a particular rating group overlapped the scores received by candidates in higher and lower rating groups. For example, in 1984 when differences in the pass rates for the rating groups were largest, the average examination score plus or minus one standard deviation for those rated 9 was 449 to 633, for those rated 6 it was 343 to 575, and for those rated 4 it was 236 to 484. Similar overlaps occurred in all other years of the study.

Correlations between the candidates' examination performance and the program directors' ratings of each component of competence were also calculated for the 1985 candidates. The correlations were .37 for clinical judgment, .41 for medical knowledge, .34 for history-taking skills, .36 for physical examination skills,

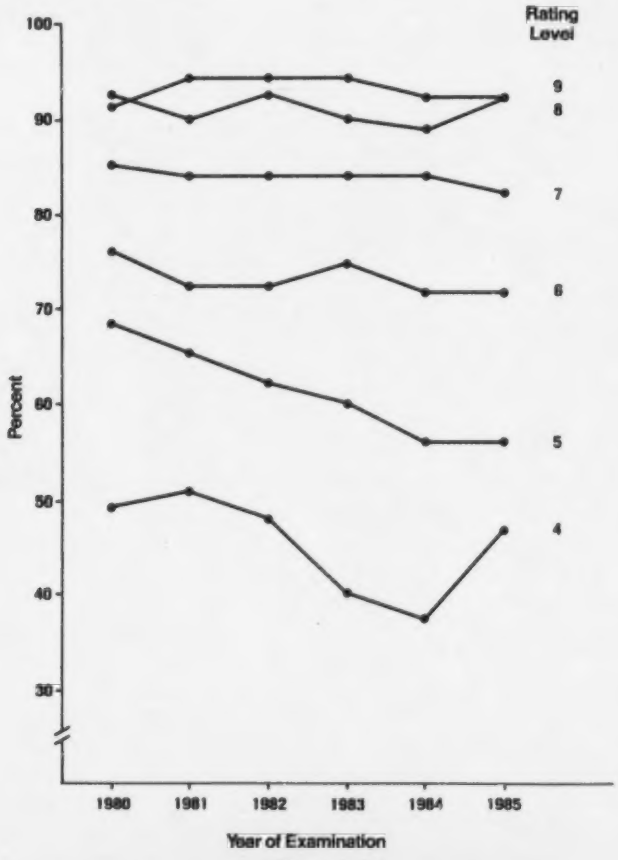

FIGURE 1

Percentage of candidates passing the certification examination of the American Board of Internal Medicine at each level of rating of overall clinical competence (rated on a 9-point scale in which superior = 7–9; satisfactory = 4–6; unsatisfactory = 1–3) by their residency program directors, 1980 through 1985 (residents with unsatisfactory ratings not allowed to take the examination).

.31 for procedural skills, .35 for medical care, .22 for attitudes, and .19 for humanistic qualities. Thus, both knowledge and clinical judgment had modest relationships with examination performance, and the clinical skills and medical care correlations were almost as large.

The relatively low correlations between the examination scores and ratings of attitudes and humanistic qualities might indicate that they measure an aspect of competence unrelated to the other components. However, the correlations among components were very high (average of .77), and a more sophisticated statistical analysis—factor analysis—in-

dicated that one trait (general competence) explains the vast majority of the variance in all seven ratings.

Discussion

The data reported here indicate a reassuring pattern of relationships between all program directors' ratings of competence and examination performance on the certification examination because the results provide evidence for the validity of the examination. The ratings of the individual components of clinical competence were correlated moderately with examination performance and correlated very highly with each other. The individual components that were less dependent on medical knowledge (for example, interpersonal skills or humanism) had slightly smaller correlations with examination performance. It may be that all the components of competence are developed to the same level by the end of training or that there is only one trait—overall competence—that is reflected in the assessment of each component. Otherwise, the high correlations among the ratings of the individual components of competence suggest a "halo" effect in which a program director's general impression of a candidate accounts for all the ratings the director assigns.

Ratings of overall clinical competence were also moderately related to examination performance. Changes in the pattern of the ratings over time, however, indicate that fewer candidates in 1984 and 1985 received the lower ratings of 4 and 5, while more received higher ratings of 7 and 8, compared with the candidates in 1980 through 1983. Moreover, the pass rates for all levels of rating remained the same or dropped during the six years. The dropping pass rates may signal changes in the standards of the certifying examination, a more qualified resident population, or shifts in the standards of program directors.

Changes in the standards of the certifying examination were not likely to account for these trends, since the pass rates for other groups used to monitor standards (for instance, candidates from better programs or repeat takers of the examination) did not change consistently over the period of the study. The trend of higher program directors' ratings could reflect higher quality residents, but the falling examination scores for the lower-rated residents do not support this explanation. Most likely, there was a shift in the standards of the program directors. Factors contributing to such a shift might include the inherent conflict of interest in program directors' ratings of their own residents (that is, their desire to see their residents do well) and the directors' fear of litigation and reluctance to record negative evaluations. These factors have been identified during the ABIM representatives' visits to individual programs, according to unpublished reports of the Hospital Visit Program of the American Board of Internal Medicine.

If the changes in the ratings reported here are due to shifts in program directors' standards, the ratings may retain their usefulness as a criterion for entrance to the ABIM's certification examination but might be less useful as a criterion against which to judge the examination. In order to provide more support to program directors and to convey better its standards, the ABIM is developing definitions and procedures to assess the clinical competence of residents better.

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Debt, Moonlighting, and Career Decisions Among Internal Medicine Residents

Rebecca A. Silliman, M.D., Ph.D., Robert S. Dittus, M.D., Ramon Velez, M.D., Steven A. Wartman, M.D., Ph.D., Mark J. Young, M.D., and Robert H. Fletcher, M.D.

Abstract—In the study reported here, medical residents were surveyed to determine their patterns of educational indebtedness, the effects of debt on their decisions about training and career, the frequency with which they begin making loan payments during training, the extent to which they moonlight and the reasons for doing so, and their opinions about the effects of moonlighting on house staff training. A total of 223 residents from four residency programs were surveyed; 181 responded. Most (86 percent) had educational debt (mean = $20,500), and more than half of those with debt were making loan payments. Forty percent of the residents moonlighted, and moonlighting was related to the presence of educational debt, monthly loan payments, and number of dependents.

The average tuition at U.S. medical schools has more than tripled in the past 10 years (1), while sources of financial assistance have declined (2). As a result of both trends, medical students are accruing ever greater debts and are relying more heavily on loans with higher interest rates (for instance, loans under the Health Education Assistance Loan Program) than previously (2). The average educational debt of graduating senior medical students is increasing by $2,000 to $3,000 per year (2). By 1986 this debt amounted to $27,493 among the graduates who participated in the Association of American Medical Colleges' (AAMC) annual graduation survey. When responding graduates without any debt were excluded from analysis, this figure rose to $33,499.*

Increasing indebtedness may influence the specialty choices of young physicians (1–3), and it may affect their graduate medical education by serving as an additional source of stress (4). Although it is widely known that many house officers moonlight to earn extra money, the extent to which moonlighting has become a necessity because of educational debt is not known.

Information about the relationship between educational debt and moonlighting is emerging (5–7). French (5) studied the

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* Personal communication, Cynthia Tudor, Ph.D., graduation questionnaire coordinator, Association of American Medical Colleges, Washington, D.C., October 22, 1986.

financial indebtedness of residents and fellows at the University of Michigan Hospital. She found that three-quarters of the trainees with debts over $20,000 wanted to moonlight, although few actually did so. The trainees with greater indebtedness more often reported that they had considered interrupting their training in order to make money to retire their debts.

The American Medical Association's 1979 survey of resident physicians also examined the relationship between educational debt and moonlighting among 3,403 residents nationwide (6, 7). Indebted residents were more likely to moonlight than residents without debt, and moonlighters had higher educational debts than did nonmoonlighters. However, when only those residents with debt were considered, the average educational debt of moonlighters was no greater than that of nonmoonlighters.

Although moonlighting is an important issue in graduate medical education, there is little objective or subjective information about its impact on house staff education (8). In an effort to understand how residents perceive moonlighting, Banahan and his colleagues (8) surveyed graduates of two family medicine residencies and found that they felt moonlighting had enhanced their training.

In the study reported here, internal medicine residents were surveyed to determine the patterns of their educational indebtedness, the effects of debt on their decisions about training and career, the frequency with which they begin making loan payments during training, the extent to which they moonlight and the reasons for doing so, and their attitudes about the effects of moonlighting on their training.

Methods

A total of 223 second- and third-year internal medicine residents at four academic medical centers were surveyed between February and May 1984. The four centers were chosen because they were located in different regions (Rhode Island, North Carolina, Michigan, and Texas) and in both metropolitan and small-city areas and because they were willing to participate in the study. Three of the centers were state-supported, and one was private.

The directors of the residency programs provided information about characteristics of the residents in their programs: the total number of second- and third-year residents in training, their annual salaries, and their race and sex distribution. At the directors' request, the authors of the present paper agreed to keep the identity of the centers confidential.

The study was confined to second- and third-year internal medicine residents to reduce the influence of factors such as stage in training and specialty, since these factors are known to influence the probability of moonlighting (7). One author supervised data collection at each site. All information was collected and coded in a manner to ensure residents' anonymity.

The residents were asked to complete a 44-item questionnaire that the authors developed, assisted by their internal medicine colleagues, including recent residency graduates. The questionnaire asked for information about the residents' demographic characteristics (age, marital status, number of dependents, type of residence, and type of undergraduate and medical school attended); the amount of their educational debt; how they met loan payments; their moonlighting behavior and its relationship to debt and other factors; the attitudes of moonlighters about the impact of moonlighting on their training; and the influence of debt on their decision-making about further training and career choices.

How residents met loan payments was

assessed by a checklist of potential resources. Perceptions about the need to and reasons for moonlighting were elicited by questions with Likert-type responses. Finally, attitudes about moonlighting and the impacts of educational debt on career and training were sought through open-ended questions.

Student's *t*-test was used to compare the means of continuous variables in two groups, such as the mean educational debt of those attending private and public medical schools and of moonlighters and nonmoonlighters. Chi-square analysis was used to evaluate the statistical significance of associations between two dichotomous variables, for example, between whether residents moonlighted or not and whether they had or did not have educational debt. Finally, correlation coefficients assessed the relationship between two continuous variables, for instance, hours per month spent moonlighting and total educational debt.

Results

Three of the surveyed programs each trained 47 or 48 second- and third-year residents each year, and the fourth trained 81. The second-year residents earned an average annual salary of $19,567 (range: $17,867–$21,603), while the third-year residents earned $20,584 (range: $18,533–$22,593). Seventy-three percent of the residents were male, and almost all (97 percent) were white.

Of these 223 internal medicine residents, 181 (81 percent) returned the questionnaire. Of these, 97 percent were white, 66 percent were male, and 56 percent were married. There were no statistically significant differences in race or sex between respondents and nonrespondents.

Of those who responded, 56 percent had attended private medical schools, 42 percent had attended state-supported schools, and 2 percent were graduates of foreign medical schools. Similar percentages were reported for the types of undergraduate schools attended (57, 41, and 2 percent, respectively).

Most of the residents (86 percent) had educational debt, which averaged $20,500 and ranged from $800 to $80,000. There was no statistically significant difference in debt level between those who had attended private and public medical schools ($20,922 versus $20,208, respectively, $p = 0.75$). Although 23 percent reported having debt from their premedical education, the amount represented only 8 percent of their total debt.

Of the 155 residents with debt, 41 (23 percent) reported that their debt had influenced either training or career decisions. This response was given more frequently by those entering practice than by those planning to enter fellowships (38 percent versus 18 percent, $p = 0.004$). For example, of the 41, more than half (54 percent) felt that fellowship training was not an option for them, either because they had a service commitment to fulfill after residency (such as the National Health Service Corps) or because of the need to make a high salary as soon as possible. In contrast, a few (12 percent) stated that subspecialty training would allow them to enter a more lucrative practice. A similar percentage felt that they could not afford to enter academic careers because of their large debts and the comparatively lower salaries for academic positions.

Asked to describe their plans following residency, 61 percent said that they would be entering fellowships or other training, 26 percent anticipated entering private practice, 10 percent had service commitments to fulfill, and 3 percent were undecided.

More than half of the residents with debt (57 percent) had already begun making loan payments against their debt. Their mean monthly debt payment was $116 (range: $15–$425). Approximately half of those who made loan payments paid less than $100 each month, 35 percent paid between $100 and $200, and 14 percent paid more than $200 each month.

Forty percent ($n = 72$) of the respondents moonlighted, averaging 30 hours per month (range: 3–108 hours). Half of these residents moonlighted more than 24 hours per month. Seventy-four percent of those who moonlighted said that it was either very essential or somewhat essential that they do so. The most frequently cited reason for moonlighting, reported by 92 percent, was to make extra money to pay for otherwise unaffordable items. Other reasons included the need to earn extra money to meet everyday expenses (reported by 65 percent) and the enjoyment and educational value of moonlighting (reported by 64 percent). Fifty-seven percent of the moonlighters making loan payments reported that they moonlighted to earn money to make payments against their educational debts.

A greater proportion of moonlighters had educational debt and monthly loan payments than did nonmoonlighters (Table 1). However, among those with educational debt or monthly loan payments, there was no significant relationship between the number of hours spent moonlighting per month and either total educational debt or monthly loan payment. Furthermore, the average total debt of moonlighters and nonmoonlighters was similar ($21,132 versus $20,025), as was their average monthly loan payment ($119 versus $113).

Moonlighters were also more likely to have dependents than nonmoonlighters (Table 1). As the number of dependents increased, so did the tendency to moonlight. Approximately one-third of the residents with no dependents moonlighted, while almost two-thirds of those with more than one dependent did so.

Sixty-eight percent of the residents who moonlighted, responding to a yes-no question, reported that moonlighting had affected their residency training. In answering subsequent open-ended questions, many of these residents noted both positive and negative effects (Table 2). Seeing a broader spectrum of patients was the most frequently cited positive effect,

TABLE 1

Numbers and Percentages of Moonlighters and Nonmoonlighters with Three Characteristics Among 181 Second- and Third-Year Residents at Four Academic Medical Centers, 1984*

Characteristics	Moonlighters ($n = 72$)		Nonmoonlighters ($n = 109$)		p
	No.	Percent	No.	Percent	
Had educational debt	67	93	88	81	0.02
Made loan repayments while in residency	43	60	46	42	0.02
Had dependents	40	56	37	34	0.004

* The academic medical centers were in Rhode Island, North Carolina, Michigan, and Texas. Three were state-supported, and one was private; two were in large metropolitan areas, and two were in small cities.

and other positive aspects reported were achieving a better understanding of the private practice of internal medicine, mastering technical skills (for example, suturing or intubation), and having the opportunity to practice independently outside the academic setting. The most frequently reported negative effect of moonlighting was having less time for reading or participation in other educational aspects of the residency program. Other negative effects reported were increased fatigue and having less time for family, hobbies, and community activities.

Discussion

The high response rate (81 percent) and apparent lack of significant differences between respondents and nonrespondents suggest that the study findings are not biased by the absence of information about nonrespondents. The respondents' personal and educational backgrounds were similar to those of internal medicine residents nationwide (9), and they had educational debt levels very similar to the national average for senior medical students reported by the Association of American Medical Colleges (10). Thus, they apparently were comparable to residents in other training programs. Of course, there may be important differences between them and their peers who chose careers in higher paying specialties, and this issue needs to be addressed by researchers.

More than half of the residents with educational debt in the present study were making loan payments during their training. For some, these payments represented about one-third of their take-home pay. Residents' salaries are unlikely to increase substantially over the next few years, especially given the financial pressures faced by academic medical centers. This assumption is supported by data from the 1983 survey of house staff stipends, benefits, and funding done by the AAMC's Council of Teaching Hospitals (11). Since 1981–82 the annual percentage of salary increase has progressively declined. Furthermore, Schleiter and Tarlov (12) estimated that residents' salaries actually diminished 30 percent, in 1983 dollars, between 1976–77 and 1983–84.

Residents will probably face even greater monthly loan payments in the future because of rising medical school tuition costs, the diminished availability of government financial aid programs with service as a repayment option, and the increasing need to take high interest loans (for example, loans under the Health Education Assistance Loan Program) (2). Many residents may not be

TABLE 2

Percentages of 49 Moonlighting Second- and Third-Year Residents at Four Academic Medical Centers Who Reported Positive and Negative Effects of Moonlighting on Their Training, 1984*

Effects	
Positive effects	
Broader range of patients	76
Better understanding of private practice	18
Increased technical skills	8
Independence in practicing	8
Negative effects	
Decreased reading time	39
Increased fatigue	24
Less time for family	20

*Of 181 respondents, 72 reported that they moonlighted; of those who moonlighted, 49 reported that moonlighting affected their training. These 49 residents responded to open-ended questions about positive and negative effects; their responses were arranged into four categories of positive effects and three categories of negative effects. The residents were at academic medical centers in Rhode Island, North Carolina, Michigan, and Texas. Three centers were state-supported, and one was private; two were in large metropolitan areas, and two were in small cities.

able to manage payments from their residency salary alone, and they will be forced to rely to a greater extent than at present on other sources of income, such as moonlighting. The need to moonlight may be particularly true for residents from poor backgrounds.

Forty percent of the residents in the present study moonlighted, and this figure is similar to that reported by Weil and colleagues (13) in a national study of internal medicine manpower. Among residents with educational debt in the present study, no statistically significant differences in amount of debt were observed between moonlighters and nonmoonlighters. However, the residents with no educational debt were less likely to moonlight than those with debt, a finding that suggests that the perception of debt rather than the actual amount of debt plays a role in the decision to moonlight. The extent to which ever-increasing debts and decreasing opportunities for lucrative practice following training will affect these patterns is not known but deserves close scrutiny.

The residents were also more likely to moonlight if they had dependents to support. Thus, perception of family responsibilities with attendant financial obligations appears to be another important determinant of the decision to moonlight. Other personal, life-style factors (such as wanting to own a home or boat or needing a new car) that also contribute to residents' decision-making about moonlighting could not be identified by the questionnaire.

Few investigators have asked house officers about the effect of moonlighting on their training (8). The residents in the present study gave candid responses when asked about this. While they reported negative effects (fewer opportunities for reading about clinical problems, more fatigue, and less time for family), they also reported positive effects. The negative effects raise questions about the effects of moonlighting, not only on the quality of patient care provided and the quality of teaching done by these residents but also on the quality of their family lives. On the other hand, the positive aspects reported by the residents suggest that moonlighting provides experiences not otherwise available in training programs. It could be argued that the perceived benefits of moonlighting were merely rationalizations on the part of the residents. However, perhaps training programs should examine actively and openly the role of moonlighting in house staff education. Do residents who moonlight learn important ambulatory clinical skills, albeit in unsupervised settings?

While the present study was not specifically designed to assess the impact of educational debt on residency training objectively, the fact that those residents with debt were more likely to moonlight and that almost one-quarter of them reported that their debt had influenced either training or career decisions suggests that this issue deserves further attention. McCue (4) has voiced concern about the relation between debt and training or career decisions. The issue was discussed by Dr. Carol Landau (Brown University Program in Medicine) and colleagues in their paper, "Stresses and Supports During Residency Training," presented at the 1984 Conference on Research in Medical Education of the AAMC. They reported an association between financial indebtedness and stress among internal medicine residents.

Perhaps as the magnitude of debt increases, so will its effects. In light of this possibility, several points are worth emphasizing. First, the average educational debt of graduating senior medical stu-

dents is increasing (2). Second, a majority of house officers are repaying growing debt using salaries that will probably remain fairly constant or even decrease in real dollars over the next several years. Third, as debt and repayment pressures mount, so will the pressures to earn more money. These pressures may be accentuated by the increasing competition for patients and the growing efforts to control health care expenditures.

In the present authors' opinions, attention should be given to the implications of increasing educational debt for postgraduate medical training. Not only are alternative funding mechanisms needed, such as privately financed loan programs for medical students (14), but also trainees need sound financial counseling. If moonlighting is to be accepted as a necessity for many house officers, residency programs must create supervised moonlighting opportunities that complement the educational experiences of their trainees. Such opportunities would decrease the financial pressures faced by house officers while at the same time broadening their ambulatory training.

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Effect of History of Psychological Counseling On Selection of Applicants for Residencies

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Abstract—The stress of medical education and its consequences are widely recognized and acknowledged. However, many students may be reluctant to seek help for stress-related problems because they are concerned over the ramifications such a decision may have on their career opportunities. The purpose of the present study was to determine the extent to which an applicant's history of having received psychological counseling for stress-related problems influenced residency program directors' perceptions of such applicants seeking admission to residency programs. Five hundred twenty-three residency directors in six medical specialties (pediatrics, internal medicine, family medicine, psychiatry, obstetrics and gynecology, and surgery) rated a hypothetical residency applicant. The student's gender and history of psychological counseling were manipulated, but their basic qualifications remained constant. The directors rated the likelihood that they would invite the student for an interview and accept the applicant for the residency. Analysis of variance showed that the directors in pediatrics, family medicine, and psychiatry viewed the hypothetical applicant more favorably overall than directors in internal medicine, obstetrics and gynecology, and surgery. The program directors rated female applicants more favorably than their male counterparts and had a strong bias against inviting for an interview or accepting into their programs students who had a history of psychological counseling. Implications of these findings are discussed.

The process of becoming a physician is a stressful experience for many students. Course work requirements, examination schedules, long and inflexible work hours, students' fear of failure, and few short-term rewards have been identified as some of the stressors in medical education (1–3). Several authors (4–6) have described the psychological difficulties that may occur in response to these stressors. Depression, anxiety, low self-esteem, psychophysiologic disorders, and problems in interpersonal relationships are a few of the problems frequently identified in medical students (4). Some research has suggested that female students may encounter greater difficulty than their male counterparts (5). For some students, the stress of medical education is of sufficient severity for them to seek professional help. Estimates indicate that approximately 15 percent of medical students receive counseling and/or therapy (4).

Although the stress of medical educa-

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tion and its consequences are widely recognized and acknowledged, many students may be reluctant to seek help for stress-related problems due to concern over the possible ramifications such a decision may have on future career opportunities. First-year residency positions are becoming increasingly competitive (7), and a student's admission of having had difficulty coping with the stress of medical school may decrease that student's attractiveness as a residency candidate. Program directors in psychiatry, for example, ranked psychological stability as the most important personal variable in selecting a prospective resident (8). Similarly, Wagoner and colleagues (9) reported that "hints of underlying problems" in a dean's letter was a significant factor in determining whether a candidate would be invited for an interview. It is pertinent, then, to inquire about the attitudes residency training directors have with respect to students who seek help in coping with difficulties that result from the stress of medical education. Are these students less likely to be invited for an interview or accepted for a residency position than similar students who have not sought help? The authors' primary purpose in the present study was to determine the extent to which psychological counseling for stress-related problems influences program directors' decisions to invite an applicant for an interview and to accept him for a residency position.

Method

Directors of residency training programs in six medical specialties—pediatrics, family medicine, internal medicine, obstetrics and gynecology, psychiatry, and surgery—were chosen for the study. The names of 200 directors in each specialty (total sample = 1,200) were selected randomly from the *1984–85 Directory of Residency Training Programs* published by the American Medical Association (10). This sample size was determined to be sufficient for detecting differences among specialties.

A one-page candidate summary description (CSD) describing the basic characteristics of a hypothetical residency applicant was developed by the present authors and sent to the training directors in 1985. In order to mask the true purpose of the study, a cover letter was enclosed that described the intent of the survey as a way of testing a new method of ranking applicants. The CSD contained a summary of the student's medical school transcripts and records, letters of recommendation, and stated career plans. The summary was written in such a manner as to convey an average student. The basic description of the applicant was held constant, but gender and history of psychological counseling were not. The applicant's sex was indicated by the applicant's name (that is, Allen or Ellen Smith) on the CSD. The following statement was inserted in the CSDs of those described as having received psychological counseling: "It was noted that Mr. (or Ms.) Smith received psychological counseling to help cope with the interpersonal difficulties arising from the stress of medical education." The four possible combinations of the hypothetical applicant were distributed equally among residency directors in each medical specialty.

The directors were instructed to read the CSD and then rate the likelihood on whether to invite the applicant for an interview and whether to accept the student for the residency. The rating was indicated by placing a slash mark on a line that connected the bipolar phrases invite–do not invite and a line for accept–reject. Each line was exactly 100 millimeters in length. The directors' ratings

were scored by measuring the position of the slash within the range 0 to 100, with 0 indicating do not invite or do not accept and 100 indicating invite or accept.

The applicants' gender, history or absence of psychological counseling, and medical specialty (pediatrics, internal medicine, family medicine, obstetrics and gynecology, psychiatry, and surgery) were the independent variables. The dependent variables were the ratings on inviting and accepting the applicant. The data were analyzed by a three-way analysis of variance.

Results

Of the 1,200 CSDs mailed to residency program directors, 23 were undeliverable and returned by the post office, and 526 were returned by the directors. Three of these were filled out incorrectly and omitted from analyses. The total sample analyzed was 523 (44 percent). Some directors failed to rate the applicant on both variables; thus, the sample size for some analyses is smaller than the total number that responded to the questionnaire.

Means and standard deviations of the directors' ratings are given for specialty, gender, and history of psychological counseling in Table 1. Analysis of variance showed that the decision to invite for an interview differed significantly by specialty ($F = 13.99$, $p < .001$). The directors in pediatrics, family medicine, and psychiatry viewed the hypothetical applicant more favorably, regardless of gender or history of psychological counseling,

TABLE 1

Mean Scores given by Program Directors to Hypothetical Applicants for Residency Positions, by Specialty of the Rater's Program and by Gender and History of Psychological Counseling of the Applicant, on Inviting the Applicant for an Interview and Accepting the Applicant into the Residency, 1986*

Variables	Scores					
	Invite to Interview			Accept into Residency		
	No.	Mean Score†	S.D.	No.	Mean Score‡	S.D.
Specialty of program						
Pediatrics	81	54	23	84	41	20
Family practice	115	55	22	114	45	20
Psychiatry	60	56	22	65	45	20
Internal medicine	66	40	28	67	34	24
Obstetrics/Gynecology	80	39	26	82	31	20
Surgery	78	38	24	76	33	19
Gender of applicant						
Male	259	46	24	256	36	20
Female	221	50	27	232	41	22
History of counseling of applicant						
With	235	44	24	236	36	20
Without	245	51	26	252	41	21

* Each of the 523 responding directors evaluated a hypothetical applicant described in a one-page synopsis of the applicant's medical school performance. The applicant's gender and history or absence of psychological counseling varied, but the other variables remained the same in the synopsis sent to different directors.

† Range = 0 (do not invite for interview) to 100 (invite for interview).

‡ Range = 0 (do not accept into program) to 100 (accept into program).

than the directors in internal medicine, obstetrics-gynecology, and surgery. The same difference was found on the decision to accept the applicant into the residency training program ($F = 8.46$, $p < .001$).

Acceptance into the residency program was significantly affected by gender ($F = 6.25$, $p < .01$). The female applicant was perceived more positively than the male applicant by the directors. With respect to inviting the student for an interview, there was a trend for the female to be more highly favored than the male ($F = 2.99$, $p < .10$), but the difference was not statistically significant.

A history of psychological counseling was found to affect both the decision to invite the applicant for an interview ($F = 11.75$, $p < .001$) and the decision to accept the applicant into the residency program ($F = 7.06$, $p < .01$). The program directors were less inclined to invite for an interview and more inclined to reject applicants with a history of psychological counseling than those without such a history.

Discussion

A bias against residency applicants with a history of psychological counseling was demonstrated in this study, as program directors were less likely to invite them than the other applicants for an interview or accept them into their programs. The results suggest that an otherwise qualified applicant may be eliminated from consideration if decision-makers determine early in the application process that the applicant has received psychological counseling. Given the importance of the interview in selecting prospective residents (9), students with a known history of psychological counseling may be particularly disadvantaged in that they may be denied the opportunity to explain the nature of their difficulty or prove that they are academically and clinically qualified for the position for which they are applying.

Program directors may believe that persons who had problems in their interpersonal relationships while in medical school may demonstrate similar difficulties during the residency and thus be "problem" residents. However, there are no published data to support this notion or the idea that these students will perform less well than their counterparts who did not have such difficulties. As suggested by their reluctance to accept students with a history of stress-related problems, program directors may assume that stress reactions are personality traits. Research has indicated, however, that the relationship between stress and how an individual copes with it is influenced by the specific parameters of the stressful situation (11). Thus, there may be little relationship between stress-related problems in medical school and performance in residency.

Because knowledge about a student's psychological history may jeopardize chances for acceptance into a residency, additional research is needed to help students make decisions about counseling. At present, there are little empirical data to which students can refer in making a decision about whether to seek counseling or about how much and what type of personal information to disclose during the residency selection process. In order to learn why students who receive psychological counseling are less desirable than those who do not receive counseling, future studies might determine whether program directors attribute negative personal characteristics to them. In addition, future research might address whether a history of counseling biases program directors against medical students with

characteristics shown to be important in candidate selection, for example, performance as an extern in the program director's institution, honors in clinical clerkship, and membership in Alpha Omega Alpha (12).

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DATAGRAM

Results of the NRMP for 1987

The number of U.S. seniors who enrolled in the National Resident Matching Program (NRMP) in 1987 decreased by 252 from a year ago (1) and was 450 less than in 1985 (2). The number who subsequently withdrew increased slightly (Table 1), and the number of active applicants decreased by 271. The number who were unmatched decreased by 111.

The total number of U.S. and Canadian citizens (consisting of U.S. seniors, "fifth pathway" students, physician candidates [earlier U.S. graduates seeking a position in graduate medical education], and osteopathic and Canadian graduates but excluding U.S. foreign medical graduates [FMGs]) who applied to the match this year decreased by 126. Among the other U.S. and Canadian citizens, the number of "fifth pathway" applicants decreased from 305 to 210; 170 participated in the match, and 83 percent were successful. The number of graduates of osteopathic schools who initially applied to the match increased by 14 percent to 884, a three-fold increase since 1983; 67 percent were matched. The number of physician applicants increased by 6 percent, and 47 percent were successful in the match.

The number of U.S. citizen-FMGs who applied decreased by 353 to 1,601, only slightly more than half of the number in 1984; 43 percent successfully matched, an increase of 4 percentage points. The number of alien FMGs decreased by 22 percent to 4,444, and the percentage matched increased by 10 percentage points to 34 percent.

The number of positions offered for the first postgraduate year (PGY-1) increased by 277; 217 more were offered in the generalist* specialties than in 1986 (Table 2), an increase of 0.2 percentage points to 65.7 percent of all positions offered. The ratio of positions per initially enrolled applicant was 0.8, an increase of 0.1; that of positions per all U.S. senior and other U.S.-Canadian citizen applicants (including U.S. FMGs) was 0.9; and that per U.S. senior was 1.2. The ratios for active applicants in the match were, respectively 1.0, 1.1, and 1.3. (Table 2 is on page 532.)

The overall filling of PGY-1 positions decreased by 1.9 percentage points, the filling of positions by U.S. seniors decreased by 1.9 percentage points, and the filling by all other applicants did not change. The most competitive programs were again in emergency medicine, obstetrics/gynecology, the surgical specialties, and radiology. The participation of programs and positions in orthopedic surgery again increased slightly. The low number of positions in neurological surgery, otolaryngology, and urology is attributable to the withdrawal of many programs in order to participate in non-NRMP matches. Again, only a few programs in plastic surgery participated in the match. The distribution of matched U.S. seniors among types of programs increased slightly in family practice, psychiatry, and the support specialties and the percentage of the class entering internal medicine and general surgery decreased.

An increased number of advanced programs for students (PGY-2 positions) were offered in the match this year; 183 programs offered 925 positions, 71 percent of which were filled by 639 U.S. seniors and 84 percent were filled by a total of 681 applicants. Fifty-four programs in diagnostic radiology offered 190 PGY-2 positions, 71 percent of which were filled by U.S. senior students and 9 percent were filled by physician applicants for a total filling of 80 percent. A total of 104 programs in anesthesiology offered 642 positions, 69 percent of which were filled by U.S. senior students and 3 percent were filled by other applicants for a total filling of 72 percent. Ninety percent of those senior students who were matched to PGY-2 positions were also matched to PGY-1 positions.

*"Generalist" specialties are defined as family practice, internal medicine, obstetrics/gynecology, and pediatrics.

TABLE 1
Participation in the National Resident Matching Program in 1987

Category	U.S. Senior Students		Other U.S. and Canadian Students*		U.S. Foreign Graduates		Foreign-Born Foreign Graduates		Total Applicants	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Total applicants	15,729	100.0	3,096	100.0	1,601	100.0	4,444	100.0	24,870	100.0
Withdrew	1,263	8.0	1,417	45.8	560	35.0	1,576	35.5	4,816	19.4
Active participants	14,466	92.0	1,679	54.2	1,041	65.0	2,868	64.5	20,054	80.6
Matched	13,596	94.0	989	58.9	448	43.0	980	34.2	16,013	79.8
Unmatched	870	6.0	690	41.1	593	57.0	1,888	65.8	4,041	20.2
Total	14,466	100.0	1,679	100.0	1,041	100.0	2,868	100.0	20,054	100.0

* Other U.S. and Canadian students consist of graduates from U.S. osteopathic schools and Canadian medical schools; physician candidates, that is, earlier U.S. graduates seeking a position in graduate medical education; "fifth pathway" students, who are U.S. nationals who completed course requirements for a medical degree abroad followed by a year of clinical training in a U.S. hospital under medical school sponsorship.

In the 1987 match 694 individuals participated as 347 couples; 91 percent of these U.S. students were successfully matched.

Several specialty matches for physician candidates were carried out by the NRMP in 1986. In the fall, 22 programs offered 46 positions in colon and rectal surgery; 100 percent were filled by 55 percent of the applicants. Late in the fall, 22 programs in emergency medicine offered 122 positions; 100 percent of them were filled by 36 percent of the applicants. In the specialty match for dermatology last fall, there were 542 applicants for 195 positions. A total of 193 (36 percent) physicians were matched to fill 99 percent of the positions.

A new match, the Medical Specialties Matching Program (MSMP), took place in June 1986 for fellowships in all of the subspecialties of internal medicine for positions to begin in July 1987. The number of participating programs was 1,184 in 16 subspecialties, and these programs offered 2,073 positions. Seventy-eight percent of these positions were filled by 1,622 applicants, who represented 72.4 percent of the active applicants.

Data that describe the trends in numbers of positions offered and filled by U.S. seniors and other applicants during the past several years are included in the NRMP's annual directories (3).

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TABLE 2

Positions Offered and Filled by Specialty and Type of Applicants in the NRMP in 1987

Specialties	Positions Offered		Applicants Matched											
			U.S. Senior Students			Other U.S. and Canadian Citizens‡			Foreign-Born Foreign Graduates			Total Applicants		
	No.	Percent*	No.	Percent		No.	Percent		No.	Percent		No.	Percent	
				*	†		*	†		*	†		*	†
Family practice	2,395	12.6	1,728	12.7	72.2	216	15.0	9.0	35	3.6	1.5	1,979	12.4	82.6
Internal medicine	7,076	37.2	4,781	35.2	67.6	578	40.2	8.2	468	47.8	6.6	5,327	36.4	82.3
Pediatrics	2,009	10.5	1,366	10.0	68.0	157	10.9	7.8	207	21.1	10.3	1,730	10.8	86.1
Obstetrics/gynecology	1,031	5.4	828	6.1	80.3	83	5.8	8.1	16	1.6	1.6	927	5.8	89.9
Psychiatry	987	5.2	675	5.0	68.4	77	5.4	7.8	73	7.4	7.4	825	5.2	83.6
Medical specialties	73	0.0	50	0.4	68.5	3	0.2	4.1	6	0.6	8.2	59	0.4	80.8
Dermatology	7	0.0	6	0.0	85.7	0	0.0	—	0	0.0	—	6	0.0	85.7
Neurology	47	0.1	30	0.2	63.8	2	0.1	4.3	5	0.5	10.6	37	0.2	78.7
Ophthalmology	19	0.0	14	0.1	73.7	1	0.1	—	1	0.1	5.3	16	0.1	84.2
General surgery	2,282	12.0	1,703	12.5	74.6	136	9.5	6.0	57	5.8	2.5	1,896	11.8	83.1
Surgical specialties	537	2.8	469	3.4	87.3	49	3.4	9.1	3	0.3	0.6	521	3.3	97.0
Neurosurgery	32	0.2	27	0.2	84.4	1	0.1	3.1	0	0.0	—	28	0.2	87.5
Orthopedics	384	2.0	335	2.5	87.2	38	2.6	9.9	3	0.3	0.8	376	2.3	97.9
Otolaryngology	40	0.2	34	0.3	85.0	5	0.3	12.5	0	0.0	—	39	0.2	97.5
Urology	74	0.4	66	0.5	89.2	5	0.3	6.8	0	0.0	—	71	0.4	95.9
Plastic surgery	7	0.0	7	0.0	100.0	0	0.0	—	0	0.0	—	7	0.0	100.0
Support specialties	1,447	7.6	1,022	7.5	70.6	80	5.6	5.5	61	6.2	4.2	1,163	7.3	80.4
Anesthesiology	323	1.7	249	1.8	77.1	5	0.3	1.5	8	0.8	2.5	262	1.6	81.1
Emergency medicine	298	1.6	264	1.9	88.6	32	2.2	10.7	2	0.2	0.7	298	1.9	100.0
Pathology	471	2.5	209	1.5	44.4	24	1.7	5.1	43	4.4	9.1	276	1.7	58.6
Physical medicine	76	0.4	66	0.5	86.8	4	0.3	5.3	2	0.2	2.6	72	0.4	94.7
Preventive medicine	8	0.0	2	0.0	25.0	0	0.0	—	2	0.2	25.0	4	0.0	50.0
Diagnostic radiology	258	1.4	221	1.6	85.7	15	1.0	5.8	3	0.3	1.2	239	1.5	92.6
Therapeutic radiology	13	0.1	11	0.1	84.6	0	0.0	—	1	0.1	7.7	12	0.1	92.3
Transitional	1,210	6.4	974	7.2	80.5	58	4.0	4.8	54	5.5	4.5	1,086	6.8	89.8
Total	19,047	100.0	13,596	100.0	71.4	1,437	100.0	7.5	980	100.0	5.1	16,013	100.0	84.1

* Percent distributions of positions offered and filled among specialties (percentages may not add due to rounding).

† Percent of positions offered in specialty that were filled by applicants.

‡ This category consists of those students listed in the footnote to Table 1 plus U.S. foreign medical graduates.